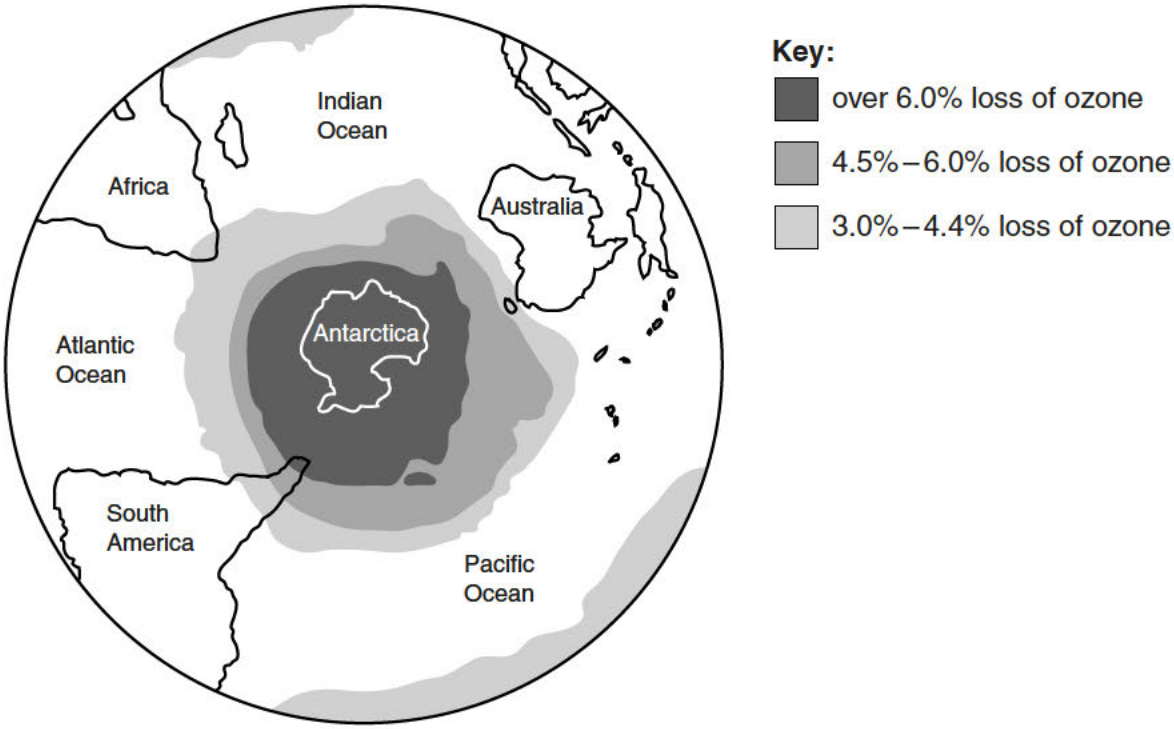
1 This question is about pollution.

(a) Look at the picture.

It shows the loss of ozone from the Earth's atmosphere.



(i) Write about the reasons why ozone is being lost from the atmosphere.

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..... **[2]**

(ii) People live in Africa, South America and Australia.

Parts of each of these continents are affected by the loss of ozone.

People in one of these three continents will be **most** affected by the loss of ozone.

Use the diagram to decide which continent this is **and** explain how the people will be affected.

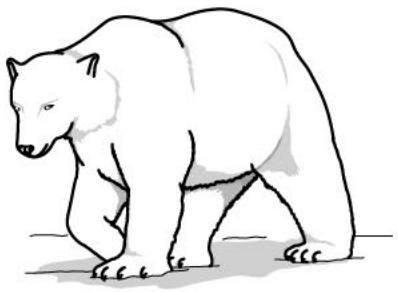
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..... **[2]**

(b) Global warming has been linked to the melting of the Arctic ice cap.

Polar bears live in the Arctic regions.



Polar bears and killer whales feed on seals.

Polar bears compete with other polar bears for seals.

They also compete with killer whales for seals.

What is the main difference between these two types of competition and if the ice cap continues to melt, explain which type of competition will be most significant for polar bears.

The quality of written communication will be assessed in your answer to this question.

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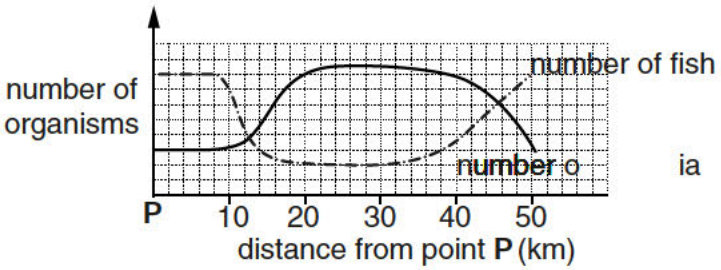
[Total: 10]

2 A factory accidently releases fertiliser into a river.

The numbers of fish and bacteria in the river are measured.

The measurements start at a place called **point P**.

The graph shows the levels at different distances from point **P**.



Suggest how far the factory was from point **P** and **explain** any patterns shown by the graph.

The quality of written communication will be assessed in your answer to this question.

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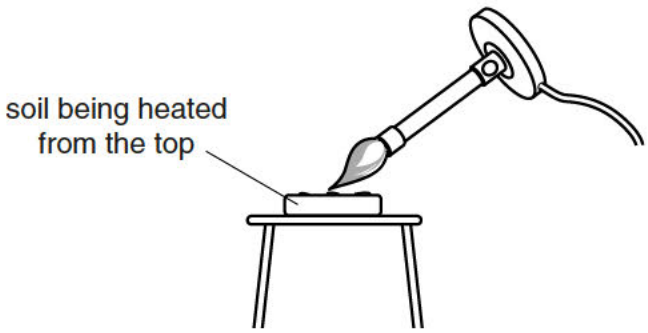
[Total: 6]

3 Deidre investigates the humus content of soil.

She weighs different soil samples that have been dried in an oven.

Deidre then burns each soil sample using a Bunsen burner.

She continues to burn them until there is no change in mass.



Deidre records her results in a table.

Soil sample	Mass before burning in g	Mass after burning in g	Change in mass in g	Percentage change in mass
A	56.65	48.52	8.13	14.35
B	55.34	54.32	1.02	1.84
C	56.10	54.36		
D	55.42	51.98	3.44	6.21

(a) The soils needed to be dry before they were burnt.

Suggest why.

.....

..... **[1]**

(b) Calculate the percentage humus content of soil **C**.

answer .....% **[2]**

(c) Which soil would be the best for growing vegetables? .....

Explain your answer.

.....

..... [1]

(d) The water content of soils can be affected by the size of the soil particles.

Explain how.

.....

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..... [2]

[Total: 6]

4 A rare animal called the quoll lives in Australia.



There are four different types of quoll living in Australia.

(a) Scientists want to investigate how closely related the different types of quoll are.

Describe one way that they could do this.

.....

..... [1]

(b) Tasmania is an island off the coast of Australia.

Foxes have recently been introduced to Tasmania.

Scientists are worried that they might compete with the quolls.

(i) Suggest why the different types of quoll are more likely to compete with each other than with foxes.

.....

..... [1]

(ii) Scientists want to set up a conservation programme to save the quolls.

They want to remove foxes from Tasmania.

Write down one reason why scientists want to save endangered species.

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..... [1]

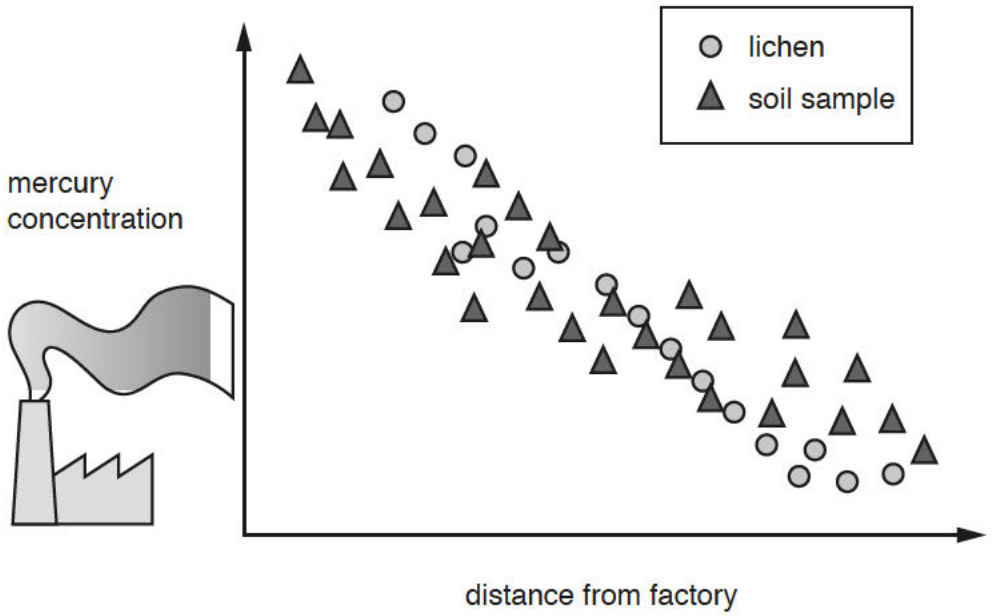
[Total: 3]

5 This question is about mercury pollution.

The normal method of detecting mercury pollution is to measure its concentration in soil.

Scientists want to know if lichens can be used to measure mercury pollution.

The graph shows the concentration of mercury in lichens and in soil at different distances from a factory.



(a) Describe the trends shown in the graph.

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..... **[2]**

(b) What conclusions can the scientists make about using lichens to measure mercury pollution?

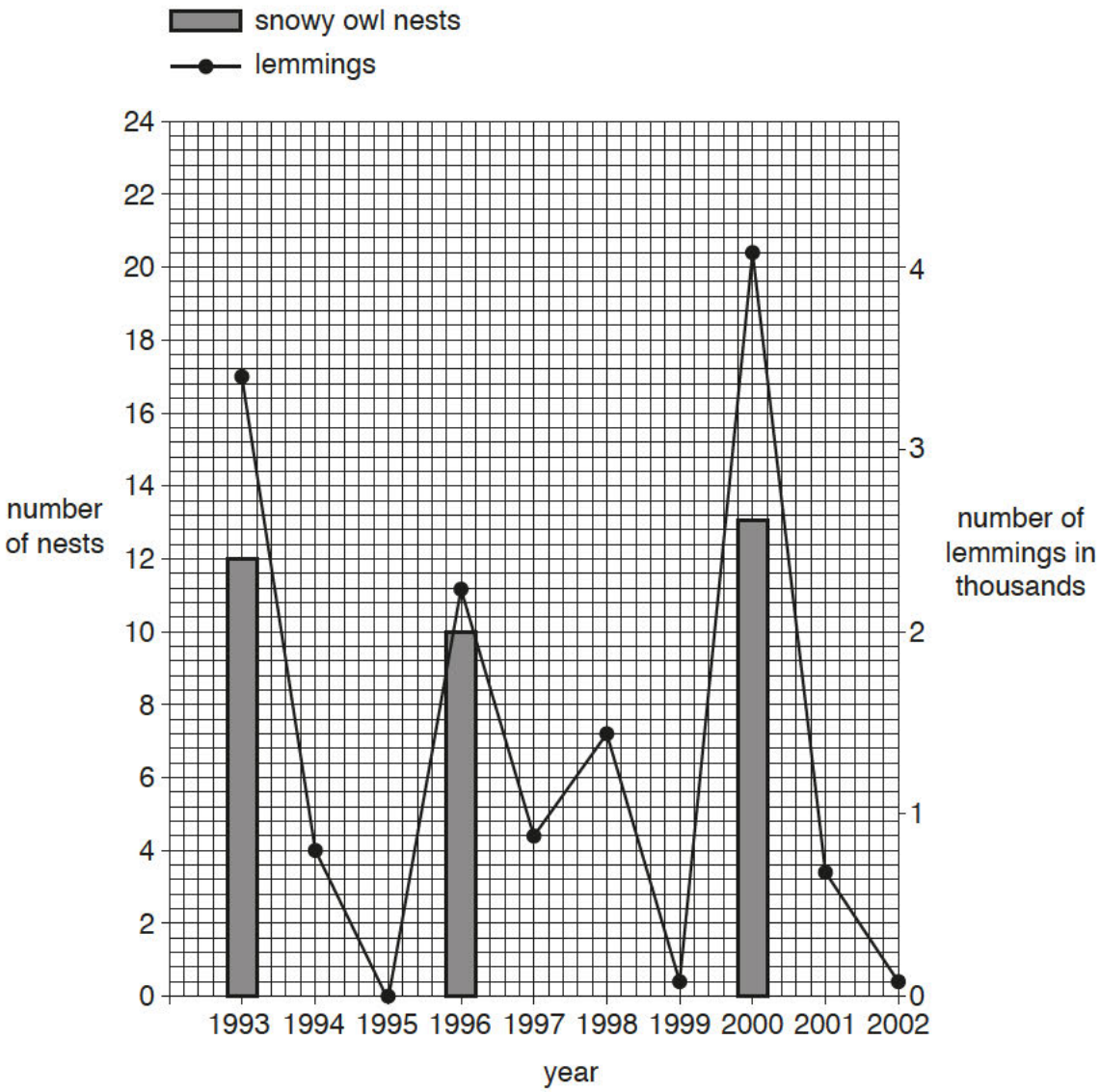
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..... **[2]**

6 **(a)** Snowy owls feed on lemmings.

The graph shows the number of snowy owl nests and the number of lemmings found on Bylot Island, Canada.



The data in the graph suggests there is a pattern shown between the breeding of snowy owls and the numbers of lemmings.

Describe this pattern and explain how it affects the **populations** of snowy owls and lemmings.

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..... **[2]**

(b) Look at the picture of a lemming.



Lemmings live in Arctic conditions.

They do **not** hibernate.

Suggest and explain how lemmings are adapted to cold environments.

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..... **[2]**

(c) Penguins also live in cold climates.

Penguins use a counter-current heat exchange system.

Explain how this adaptation reduces heat loss.

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..... **[2]**

7 Lake Tahoe is a large lake in California.

(a) In 1968, people noticed that algae in the lake were increasing in numbers.

They thought it could be a sign that the lake was becoming more polluted.

(i) Write down the name of **one** type of pollutant that could have caused the increase in algae.

..... **[1]**

(ii) If the algae all die at once then this could cause fish in the lake to die.

Explain how the death of large numbers of algae could cause the death of fish.

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..... **[2]**

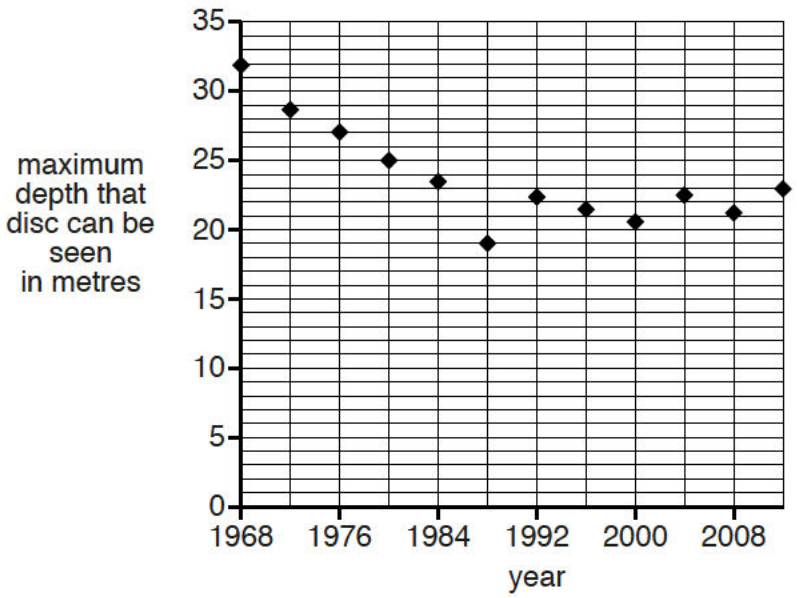
(b) Scientists have been taking measurements of how clear the water is in Lake Tahoe since 1968.

A black and white disc is slowly lowered into the water.

When the disc cannot be seen, the depth of the disc is measured.



The graph shows the results for Lake Tahoe.



(i) Explain why it is important that each measurement was taken at the same time in the year.

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..... **[1]**

(ii) Describe the evidence shown by the graph about pollution in Lake Tahoe.

Explain your answer.

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..... **[3]**

(iii) Many of the pollutants are washed into the lake when winter snow melts rapidly.

In which year was there rapid melting of snow around Lake Tahoe?

..... **[1]**